

SEQUENCE LISTING

<110> E. I. du Pont de Nemours and Company
<120> Genes Encoding Sulfate Assimilation Proteins
<130> BB-1167-B

<140>
<141>

<150> 60/092,833
<151> 1998-07-14

<160> 14

<170> Microsoft Office 97

<210> 1
<211> 890
<212> DNA
<213> Zea mays

<400> 1
ggtcagcggc ggccggccgtc gcagggatca gcagcagcag cagcgcgctg gtgacacctga 60
ccgtcggaa atcgacgaac atcctgtggc atgagtgcgc catcgggcag aaggagcgac 120
agggtctgct gaaccagaag ggctgcgtcg tggatcacg ggttcaggga 180
aaagcacgct cgcgtgcgcg ctgagccgcg agctgcacgg cagaggccac ctcacgtacg 240
tcctcgacgg cgacaacctc aggacacggc tgaacaggga cctcagcttc ggagcagagg 300
accgcgcgcga gaacatccgc agagtagggg aagttagcgaa gctgttcgccc gacgctggcc 360
tcgtctgcat cgccagcctc atatcgccct acagaagcga ccgaagcgcg tgcgcgatc 420
tgctgcccaa gcactcggtt atcgaggtgt tcctggacgt gccgcttcaa gtgtgcgaag 480
ccagggaccc caaaggcctc tacaagctcg cacgcgcggg caaaatcaaa gggttcacccg 540
gcatcgacga tccttacgaa ccgcgcgtcg actgtgagat agtgcattcg tgtaaagtgc 600
gcgactgccc ttgcctgaa tcgatggctg gtcacgttgcgt tacgtgcaccc 660
gtttcctcca ggactagaca tggaaatgcga tacgtgcgtc tgatgtgtat atatgttagca 720
gcagccggag cggcattgcc aaggctgtgt aatctcatgg ctgtcttct cttaagacc 780
aaaacaaaca agagatggca gtgtaaaaag gaaaaaaaaa actgcgtctg acagagtcgc 840
tgaatcaacc atgcttctgaa taaaaaaaaaa aaaaaaaaaa aaaaaaaaaa 890

<210> 2
<211> 224
<212> PRT
<213> Zea mays

<400> 2
Ser Ala Ala Ala Ala Val Ala Gly Ile Ser Ser Ser Ser Ala Leu
1 5 10 15

Val Thr Ser Thr Val Gly Lys Ser Thr Asn Ile Leu Trp His Glu Cys
20 25 30

Ala Ile Gly Gln Lys Glu Arg Gln Gly Leu Leu Asn Gln Lys Gly Cys
35 40 45

Val Val Trp Ile Thr Gly Leu Ser Gly Ser Gly Lys Ser Thr Leu Ala
50 55 60
'
Cys Ala Leu Ser Arg Glu Leu His Gly Arg Gly His Leu Thr Tyr Val
65 70 75 80

Leu Asp Gly Asp Asn Leu Arg His Gly Leu Asn Arg Asp Leu Ser Phe
85 90 95

Gly Ala Glu Asp Arg Ala Glu Asn Ile Arg Arg Val Gly Glu Val Ala
100 105 110

Lys Leu Phe Ala Asp Ala Gly Leu Val Cys Ile Ala Ser Leu Ile Ser
115 120 125

Pro Tyr Arg Ser Asp Arg Ser Ala Cys Arg Asp Leu Leu Pro Lys His
130 135 140

Ser Phe Ile Glu Val Phe Leu Asp Val Pro Leu Gln Val Cys Glu Ala
145 150 155 160

Arg Asp Pro Lys Gly Leu Tyr Lys Leu Ala Arg Ala Gly Lys Ile Lys
165 170 175

Gly Phe Thr Gly Ile Asp Asp Pro Tyr Glu Pro Pro Ser Asp Cys Glu
180 185 190

Ile Val Ile Gln Cys Lys Val Gly Asp Cys Pro Ser Pro Glu Ser Met
195 200 205

Ala Gly His Val Val Ser Tyr Leu Glu Thr Asn Gly Phe Leu Gln Asp
210 215 220

<210> 3

<211> 1217

<212> DNA

<213> Zea mays

<400> 3

gcgtccgtt cattcatca atcaaacaga acctctggc acacacacgc agcaaccacc 60
gagcccagcg cccggcccag ccagccagg ccaacggcaa ggcaacaccc tcctcagccc 120
gacgcccacg ctgcgtca tcctcgtaaa tccacagcgc ggcgcctccg tcctccagg 180
cctcacccct agcgatgcgc cactcccgcc gtcgtgatc catggcctca ctccccgttc 240
ctcacactct tccgcgggtc tcgccagtga tagtggcgcg cgcgaggggg agggccgcgg 300
tgccgtacg cactgccacc gcggcattgg gcgggtgggtg cggcggcggc ggcggaatgg 360
agcagcggcc ggggaggccc cgcacagccc agtgaaggag aagcctgtaa tgtcgaacat 420
tggaaatcg actaatattt tatggcacaa ttgcttgatt ggacaatctg atagacagaa 480
attgctggga caaaaaggct gtgtcgatg gataacagga ctcagtggtt cagggaaaag 540
tactcttgca tgtgcactga gtcgtgagtt gcattgcaga gccacactca cgtatgtact 600
tgatggtgac aacctcagac atggcttaaa tagagattt agctttaagg cagaagaccg 660
tgcagaaaaat atacgaagag ttggtaaagt ggcaaagctt ttgctgtatg ctgggtgtcat 720
atgcattgct agcttgatat ctccatatacg gagagatcgt gatgcgtgcc gtgctctact 780
tccacattct aaccttattt aagtattt tgatttgccc ctaaaaattt gtgaagctcg 840
tgatcctaaa ggctataaca agcttgcacg tacaggaaag attaaaggaa tcactggaat 900
tgatgatcca tacgaaccac caattaatgg tgagatagta attaagatga aagatgagga 960
atgcccttca cccaaagcaa tggccaagca agttctatgc taccttgaag aaaacggata 1020
tttgcagact tagtatatgt attttgagaa gattgatctg attcttgtt gtccattact 1080
tgtggacaca ataagatctg ttgttggta catgaataaa aggcatcaac atgttaggaag 1140
taacagaagg tacggttcat tcagaaacgg atatggattc attcgttaa aaaaaaaaaa 1200
aaaaaaaaaa aaaaaaaaaa 1217

<210> 4

<211> 343

<212> PRT

<213> Zea mays

<400> 4

Arg Pro Phe His Phe Ile Asn Gln Thr Glu Pro Leu Val Thr His Thr
1 5 10 15

Gln Gln Pro Pro Ser Pro Ala Pro Gly Pro Ala Ser Gln Gly Gln Arg
20 25 30

Gln Gly Asn Thr Leu Leu Ser Pro Thr Pro Thr Leu Ala Val Ile Leu
35 40 45

Val Asn Pro Gln Arg Ala Pro Pro Val Leu Pro Gly Leu Thr Pro Ser
50 55 60

Asp Ala Pro Leu Pro Ala Leu Val Ile His Gly Leu Thr Pro Arg Ser
65 70 75 80

Ser His Ser Ser Ala Gly Leu Ala Ser Asp Ser Gly Arg Arg Glu Gly
85 90 95

Glu Gly Arg Gly Ala Arg Thr His Cys His Arg Gly Ile Gly Arg Trp
100 105 110

Val Arg Arg Arg Arg Asn Gly Ala Ala Pro Gly Glu Ala Pro His
115 120 125

Ser Pro Val Lys Glu Lys Pro Val Met Ser Asn Ile Gly Lys Ser Thr
130 135 140

Asn Ile Leu Trp His Asn Cys Leu Ile Gly Gln Ser Asp Arg Gln Lys
145 150 155 160

Leu Leu Gly Gln Lys Gly Cys Val Val Trp Ile Thr Gly Leu Ser Gly
165 170 175

Ser Gly Lys Ser Thr Leu Ala Cys Ala Leu Ser Arg Glu Leu His Cys
180 185 190

Arg Gly His Leu Thr Tyr Val Leu Asp Gly Asp Asn Leu Arg His Gly
195 200 205

Leu Asn Arg Asp Leu Ser Phe Lys Ala Glu Asp Arg Ala Glu Asn Ile
210 215 220

Arg Arg Val Gly Glu Val Ala Lys Leu Phe Ala Asp Ala Gly Val Ile
225 230 235 240

Cys Ile Ala Ser Leu Ile Ser Pro Tyr Arg Arg Asp Arg Asp Ala Cys
245 250 255

Arg Ala Leu Leu Pro His Ser Asn Phe Ile Glu Val Phe Ile Asp Leu
260 265 270

Pro Leu Lys Ile Cys Glu Ala Arg Asp Pro Lys Gly Leu Tyr Lys Leu
275 280 285

Ala Arg Thr Gly Lys Ile Lys Gly Phe Thr Gly Ile Asp Asp Pro Tyr
290 295 300

Glu Pro Pro Ile Asn Gly Glu Ile Val Ile Lys Met Lys Asp Glu Glu
305 310 315 320

Cys Pro Ser Pro Lys Ala Met Ala Lys Gln Val Leu Cys Tyr Leu Glu
325 330 335

Glu Asn Gly Tyr Leu Gln Ala
340

<210> 5
<211> 431
<212> DNA
<213> Oryza sativa

<220>
<221> unsure
<222> (48)
<223> n = A, C, G or T

<220>
<221> unsure
<222> (346)
<223> n = A, C, G or T

<220>
<221> unsure
<222> (431)
<223> n = A, C, G or T

<400> 5
cttacacaga gatcaggtag aacagtggc gagaacaaag ttttgcattt gtcattcaatt 60
gtgccgaagg cgtccatatat cttctggcat gattgtgcag ttggccaggc tgatcgccag 120
aagctactga agcagaaagg ttgcgttggtt tggatcacag gacttagtgg ttcaggtaaa 180
agtaccctgg catgcacatt agatcgagag ctccatacaa gagggaaagct ttcttatgtt 240
cttgatggtg ataatattaag acatggtttg aacaaggatc ttggctttaa ggcggaagac 300
cgtgctgaaa atatacgc当地 agttggtagt gtagcaaagc tattcnccaga tgcaagccta 360
gtatgcattt caagtttcaa atctccctat aagagagaac gtgagtcctg gccctgcaat 420
attgtcaat n 431

<210> 6
<211> 118
<212> PRT
<213> Oryza sativa

<220>
<221> UNSURE
<222> (98.)
<223> Xaa = ANY AMINO ACID

<400> 6
Ser Ile Val Pro Lys Ala Ser Asn Ile Phe Trp His Asp Cys Ala Val
1 5 10 15

Gly Gln Ala Asp Arg Gln Lys Leu Leu Lys Gln Lys Gly Cys Val Val
20 25 30

Trp Ile Thr Gly Leu Ser Gly Ser Gly Lys Ser Thr Leu Ala Cys Thr
35 40 45

Leu Asp Arg Glu Leu His Thr Arg Gly Lys Leu Ser Tyr Val Leu Asp
50 55 60

Gly Asp Asn Leu Arg His Gly Leu Asn Lys Asp Leu Gly Phe Lys Ala
65 70 75 80

Glu Asp Arg Ala Glu Asn Ile Arg Lys Val Gly Glu Val Ala Lys Leu
85 90 95

Phe Xaa Asp Ala Ser Leu Val Cys Ile Ala Ser Phe Lys Ser Pro Tyr
100 105 110

Lys Arg Glu Arg Glu Ser
115

<210> 7

<211> 936

<212> DNA

<213> Glycine max

<400> . 7

gcacgagcca ccgcgaaggc tctgcgacag ccctgctacg ccggaatctt tcgcaacatc 60
gaatgcggcc cgtcgccggc ggcggagtgc cttagggttc cgaagctccg cgaaatcaac 120
gtcactggat tgcactgcgg cgcggaggc ctcgtcctcg tcctccgtgc aaaatcaaag 180
ccgattaggg cgaaggagaa cgcaagcgta agtgcttctc tgatcgatga ctggttcaag 240
ccaattacgg cgaaggagga ttctaaccgca gaggaccgtg catcttcgtt ttctggtaaa 300
aatctcaccc agatgtcaaa tggttggAAC tcgacaAAAC ttatgtggca tgactgtcca 360
attcagaaac aagatagaca gcagctgctt cagcaacaag gctgtgttat atggctaact 420
ggcctcagcg gatcaggaaa aagcactatt gcatgtgctc tgagtcaaag cttgcactcc 480
aaaggaaaaac tgtcttacat ccttgatggt gacaatattc ggcatggct aaaccagat 540
cttagttta gaggagaaga tcgttctgaa aacattagaa ggattggta ggtggcaaaa 600
ctcttgcag atgctggtgt tatttgcatt actagtttaa tatcaccata cccaaagagat 660
agagatgcat gcagagcact actttcaaaa ggagattttt ttgagggttt catagatgtt 720
ccactacatg tgtgtgaagc tagggaccctt aaggactct acaagcttgc tcgagctgga 780
aagatcaaag gtttcaactgg tatagatgtat ccatatgaac caccgtgttag ttgtgagata 840
gtattacaac agaaaggaag tgactgtaaag tctcccagtg atatggctga agaagtgata 900
tcctacttgg aggagaacgg atacctgcgg gcttga 936

<210> 8

<211> 311

<212> PRT

<213> Glycine max

<400> . 8

Ala Arg Ala Thr Ala Lys Ala Leu Arg Gln Pro Cys Tyr Ala Gly Ile
1 5 10 15

Phe Arg Asn Ile Glu Cys Gly Pro Ser Pro Ala Ala Glu Ser Leu Gly
20 25 30

Phe Pro Lys Leu Arg Gly Ile Asn Val Thr Gly Leu His Cys Gly Arg
35 40 45

Arg Gly Leu Val Leu Val Leu Arg Ala Lys Ser Lys Pro Ile Arg Ala
50 55 60

Lys Glu Asn Ala Ser Val Ser Ala Ser Leu Ile Asp Asp Trp Phe Lys
65 70 75 80

Pro Ile Thr Ala Lys Glu Asp Ser Asn Ala Glu Asp Arg Thr Ser Ser

85	90	95
Phe Ser Gly Lys Asn Leu Thr Gln Met Ser Asn Val Gly Asn Ser Thr		
100	105	110
Asn Ile Met Trp His Asp Cys Pro Ile Gln Lys Gln Asp Arg Gln Gln		
115	120	125
Leu Leu Gln Gln Gln Gly Cys Val Ile Trp Leu Thr Gly Leu Ser Gly		
130	135	140
Ser Gly Lys Ser Thr Ile Ala Cys Ala Leu Ser Gln Ser Leu His Ser		
145	150	155
Lys Gly Lys Leu Ser Tyr Ile Leu Asp Gly Asp Asn Ile Arg His Gly		
165	170	175
Leu Asn Gln Asp Leu Ser Phe Arg Ala Glu Asp Arg Ser Glu Asn Ile		
180	185	190
Arg Arg Ile Gly Glu Val Ala Lys Leu Phe Ala Asp Ala Gly Val Ile		
195	200	205
Cys Ile Thr Ser Leu Ile Ser Pro Tyr Gln Lys Asp Arg Asp Ala Cys		
210	215	220
Arg Ala Leu Leu Ser Lys Gly Asp Phe Ile Glu Val Phe Ile Asp Val		
225	230	235
240		
Pro Leu His Val Cys Glu Ala Arg Asp Pro Lys Gly Leu Tyr Lys Leu		
245	250	255
Ala Arg Ala Gly Lys Ile Lys Gly Phe Thr Gly Ile Asp Asp Pro Tyr		
260	265	270
Glu Pro Pro Cys Ser Cys Glu Ile Val Leu Gln Gln Lys Gly Ser Asp		
275	280	285
Cys Lys Ser Pro Ser Asp Met Ala Glu Glu Val Ile Ser Tyr Leu Glu		
290	295	300
Glu Asn Gly Tyr Leu Arg Ala		
305	310	

<210> 9
 <211> 928
 <212> DNA
 <213> Triticum aestivum

<400> 9
 gcacgaggc ggacgcaggg gagaggatgg cgggtcaga agccgtgccg gtgggtggctg 60
 tggctgccgg gaagcagccc gtcaatggat cagccatggc aggtatcgac aagcttgcga 120
 cctcaactgt tggaaatcg acaaaccttc tttggcatga ctgtccaata ggtcagttg 180
 agaggcagga actgctaaat cagaagggtt gtgttgtgt gataaacaggg ttaagtgttt 240
 cagggaaaaag cacactagca tgcgcgctaa gtcgcgagct gcactccaga ggtcatctga 300
 cctacattct agacggtgac aatctaaggc atgggttaaa ccgagacctc tggcgaag 360
 caaaggaccg tgctgaaaat atacgcagag taggagaagt agcaaagctg tttgcagatg 420
 ctggtctgat ctgcattgtct agcttgatat caccctacag aagtgaacgc agcgcttgcc 480
 gcaaattact gcacaattct acattcatcg aggtgtttt gaatgtccca cttgaagttt 540
 gtgaagctag ggatccaaaa ggcttgatac agcttgcccc tgcaggaaaa atcaaagggt 600

ttactggaat tcatgtatcct tatgaagcac cttctgactg cgagatagt atacagtgc 660
aagctggta ctgcgccacg cctaaatcg tggctgatca agttgtgtca tatcttgaag 720
caaattgagtt cttacaggaa tagagacgt tgctatggat gaaaaaacat tctgaaattg 780
gatcgccaag ggatgtgaaa tatgaggtatgatccatgatcataaattgaaatg 840
tgagaacata tatattgaca taaagatcg atctgtacat cattataata aattgaaatg 900
ttttgacgca aaaaaaaaaaaaaaa 928

<210> 10
<211> 246
<212> PRT
<213> Triticum aestivum

<400> 10
Thr Arg Ala Asp Ala Gly Glu Arg Met Ala Gly Ser Glu Ala Val Pro
1 5 10 15

Val Val Ala Val Ala Ala Gly Lys Gln Pro Val Asn Gly Ser Ala Met
20 25 30

Ala Gly Ile Asp Lys Leu Val Thr Ser Thr Val Gly Lys Ser Thr Asn
35 40 45

Val Leu Trp His Asp Cys Pro Ile Gly Gln Phe Glu Arg Gln Glu Leu
50 55 60

Leu Asn Gln Lys Gly Cys Val Val Trp Ile Thr Gly Leu Ser Gly Ser
65 70 75 80

Gly Lys Ser Thr Leu Ala Cys Ala Leu Ser Arg Glu Leu His Ser Arg
85 90 95

Gly His Leu Thr Tyr Ile Leu Asp Gly Asp Asn Leu Arg His Gly Leu
100 105 110

Asn Arg Asp Leu Cys Phe Glu Ala Lys Asp Arg Ala Glu Asn Ile Arg
115 120 125

Arg Val Gly Glu Val Ala Lys Leu Phe Ala Asp Ala Gly Leu Ile Cys
130 135 140

Ile Ala Ser Leu Ile Ser Pro Tyr Arg Ser Glu Arg Ser Ala Cys Arg
145 150 155 160

Lys Leu Leu His Asn Ser Thr Phe Ile Glu Val Phe Leu Asn Val Pro
165 170 175

Leu Glu Val Cys Glu Ala Arg Asp Pro Lys Gly Leu Tyr Lys Leu Ala
180 185 190

Arg Ala Gly Lys Ile Lys Gly Phe Thr Gly Ile Asp Asp Pro Tyr Glu
195 200 205

Ala Pro Ser Asp Cys Glu Ile Val Ile Gln Cys Lys Ala Gly Asp Cys
210 215 220

Ala Thr Pro Lys Ser Met Ala Asp Gln Val Val Ser Tyr Leu Glu Ala
225 230 235 240

Asn Glu Phe Leu Gln Glu
245

<210> 11
 <211> 521
 <212> DNA
 <213> Triticum aestivum

<400> 11
 gcacgagct tgcacgcaca ggaaagatta aagggttcac cggagtttat gatccatacg 60
 aatcaccagt gaatagttagt atagtaattt agatggaaagg tggggaatgc ctttcaccga 120
 aggcaatggc ccagcaagtt ctgtccattt ttgagaagaa cggatattt caggcttagc 180
 atatatatac tccagatcca gaagattgaa cttattcttc tgtgtccata actcatggac 240
 acaggcatga tccatgggt cgcatccgga ataaaaggcg ctgttattga agcaacaagc 300
 tgccttttc acggggaaag ggacgcagat cgatgatcag tttgattgtt cggcattgtct 360
 cctctcgcc gtgttgtctt attttagctg tagtctatac ttgctcattt cggctgaat 420
 ggtgtctgt gctgtgtgtt ttgtaatgtt tgatttgattt gtgggtgtca 480
 aaagtacgaa tgaataaattc gtgcttgcgt tttcaaaaaa a 521

<210> 12
 <211> 58
 <212> PRT
 <213> Triticum aestivum

<400> 12
 Thr Arg Leu Ala Arg Thr Gly Lys Ile Lys Gly Phe Thr Gly Val Asp
 1 5 10 15

Asp Pro Tyr Glu Ser Pro Val Asn Ser Glu Ile Val Ile Lys Met Glu
 20 25 30

Gly Gly Glu Cys Pro Ser Pro Lys Ala Met Ala Gln Gln Val Leu Ser
 35 40 45

Tyr Leu Glu Lys Asn Gly Tyr Leu Gln Ala
 50 55

<210> 13
 <211> 312
 <212> PRT
 <213> Catharanthus roseus

<400> 13
 Met Ile Gly Ser Val Lys Arg Pro Val Val Ser Cys Val Leu Pro Glu
 1 5 10 15

Phe Asp Phe Thr Glu Ser Thr Gly Leu Gly Lys Lys Ser Ser Val
 20 25 30

Lys Leu Pro Val Asn Phe Gly Ala Phe Gly Ser Gly Gly Glu Val
 35 40 45

Lys Leu Gly Phe Leu Ala Pro Ile Lys Ala Thr Glu Gly Ser Lys Thr
 50 55 60

Ser Ser Phe Gln Val Asn Gly Lys Val Asp Asn Phe Arg His Leu Gln
 65 70 75 80

Pro Ser Asp Cys Asn Ser Asn Ser Asp Ser Ser Leu Asn Asn Cys Asn
 85 90 95

Gly Phe Pro Gly Lys Lys Ile Leu Gln Thr Thr Val Gly Asn Ser

	100	105	110
Thr Asn Ile Leu Trp His Lys Cys Ala Val Glu Lys Ser Glu Arg Gln			
115	120	125	
Glu Pro Leu Gln Gln Arg Gly Cys Val Ile Trp Ile Thr Gly Leu Ser			
130	135	140	
Gly Ser Gly Lys Ser Thr Leu Ala Cys Ala Leu Ser Arg Gly Leu His			
145	150	155	160
Ala Lys Gly Lys Leu Thr Tyr Ile Leu Asp Gly Asp Asn Val Arg His			
165	170	175	
Gly Leu Asn Ser Asp Leu Ser Phe Lys Ala Glu Asp Arg Ala Glu Asn			
180	185	190	
Ile Arg Arg Ile Gly Glu Val Ala Lys Leu Phe Ala Asp Ala Gly Val			
195	200	205	
Ile Cys Ile Ala Ser Leu Ile Ser Pro Tyr Arg Lys Pro Pro Asp Ala			
210	215	220	
Cys Arg Ser Leu Leu Pro Glu Gly Asp Phe Ile Glu Val Phe Met Asp			
225	230	235	240
Val Pro Leu Lys Val Cys Glu Ala Arg Asp Pro Lys Gly Leu Tyr Lys			
245	250	255	
Leu Ala Arg Ala Gly Lys Ile Lys Gly Phe Thr Gly Ile Asp Asp Pro			
260	265	270	
Tyr Glu Pro Pro Leu Lys Ser Glu Ile Val Leu His Gln Lys Leu Gly			
275	280	285	
Met Cys Asp Ser Pro Cys Asp Leu Ala Asp Ile Val Ile Ser Tyr Leu			
290	295	300	
Glu Glu Asn Gly Tyr Leu Lys Ala			
305	310		
<210> 14			
<211> 276			
<212> PRT			
<213> Arabidopsis thaliana			
<400> 14			
Met Ile Ala Ala Gly Ala Lys Ser Leu Leu Gly Leu Ser Met Ala Ser			
1	5	10	15
Pro Lys Gly Ile Phe Asp Ser Asn Ser Met Ser Asn Ser Arg Ser Val			
20	25	30	
Val Val Val Arg Ala Cys Val Ser Met Asp Gly Ser Gln Thr Leu Ser			
35	40	45	
His Asn Lys Asn Gly Ser Ile Pro Glu Val Lys Ser Ile Asn Gly His			
50	55	60	
Thr Gly Gln Lys Gln Gly Pro Leu Ser Thr Val Gly Asn Ser Thr Asn			

65	70	75	80
Ile Lys Trp His Glu Cys Ser Val Glu Lys Val Asp Arg Gln Arg Leu			
85	90	95	
Leu Asp Gln Lys Gly Cys Val Ile Trp Val Thr Gly Leu Ser Gly Ser			
100	105	110	
Gly Lys Ser Thr Leu Ala Cys Ala Leu Asn Gln Met Leu Tyr Gln Lys			
115	120	125	
Gly Lys Leu Cys Tyr Ile Leu Asp Gly Asp Asn Val Arg His Gly Leu			
130	135	140	
Asn Arg Asp Leu Ser Phe Lys Ala Glu Asp Arg Ala Glu Asn Ile Arg			
145	150	155	160
Arg Val Gly Glu Val Ala Lys Leu Phe Ala Asp Ala Gly Ile Ile Cys			
165	170	175	
Ile Ala Ser Leu Ile Ser Pro Tyr Arg Thr Asp Arg Asp Ala Cys Arg			
180	185	190	
Ser Leu Leu Pro Glu Gly Asp Phe Val Glu Val Phe Met Asp Val Pro			
195	200	205	
Leu Ser Val Cys Glu Ala Arg Asp Pro Lys Gly Leu Tyr Lys Leu Ala			
210	215	220	
Arg Ala Gly Lys Ile Lys Gly Phe Thr Gly Ile Asp Asp Pro Tyr Glu			
225	230	235	240
Pro Pro Leu Asn Cys Glu Ile Ser Leu Gly Arg Glu Gly Gly Thr Ser			
245	250	255	
Pro Ile Glu Met Ala Glu Lys Val Val Gly Tyr Leu Asp Asn Lys Gly			
260	265	270	
Tyr Leu Gln Ala			
275			